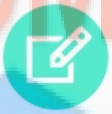
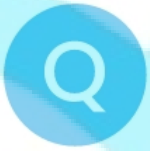


QUIZZES

Practice test 2 Unit 10



10 Questions

7 min

Topics

Photon

Start Quiz

06 : 59

Q 1/10 7 min Hint

Q : The frequency of light beam A is twice that of light beam B. The ratio E_A/E_B of photon energies is

A 1

B 4

C 1/2

D 2

06 : 56

Q 2/10 7 min Hint

Q : Which one of the following radiations has the strongest photon?

A T.V waves

B Micro waves

C X-rays

D γ-rays

06 : 54

Q 3/10 7 min Hint

Q : The curve drawn between velocity and frequency of photon in vacuum will be a:

A straight line parallel to velocity axis

B hyperbola

C straight line passing through origin and making an angle of 45° with frequency axis

D straight line parallel to frequency axis

06 : 52

Q 4/10 7 min Hint

Q : The speed of photon :

A May be greater than speed of light

B Must be equal to speed of light

C May be less than speed of light

D Must be less than speed of light

06 : 50

Q 5/10 7 min Hint

Q : A radio station emits 10 kW power of 90.8 MHz. Find the number of photon emitted per second

A 1.6×10^{28}

B 1.6×10^{29}

C 1.6×10^{30}

D 1.6×10^{32}

06 : 48

Q 6/10 7 min Hint

Q : A photon is _____

A a unit of energy

B a positively charged particle

C a quantum of electromagnetic radiation

D a unit of wavelength

06 : 45

Q 7/10 7 min Hint

Q : If n number of photon are striking on a metal surface, then total momentum exerted is _____

A nh/λ

B 2nhλ

C zero

D n f×t

06 : 43

Q 8/10 7 min Hint

Q : The momentum of a photon is 3.3×10^{-29} kg-m/sec. Its frequency will be

A 7.5×10^{12} Hz

B 6×10^{3} Hz

C 3×10^{3} Hz

D 1.5×10^{13} Hz.

06 : 41

Q 9/10 7 min Hint

Q : The momentum of a photon is 2×10^{-16}gm-cm/sec. Its energy is

A 6×10^{-8}erg.

B 6×10^{-6}erg

C 2.0×10^{-26}erg

D 0.61×10^{-26}erg

06 : 39

Q 10/10 7 min Hint

Q : An AIR station is broadcasting the waves of wavelength 300 metres. If the radiating power of the transmitter is 10 kW, then the number of photons radiated per second is

A 1.5×10^{29}

B 1.5×10^{33}.

C 1.5×10^{31}

D 1.5×10^{35}

QUIZ RESULT

Practice test 2 Unit 10

10	7 min
03-May-2021	0 sec
0/10	0.0%

Result Detail

Correct Unattempted

Incorrect Q 1/10

Q : The frequency of light beam A is twice that of light beam B. The ratio E_A/E_B of photon energies is

A 1

B 4

C 1/2

D 2

Explanation

$$E \propto f \rightarrow \frac{E_A}{E_B} = \frac{f_A}{f_B} = \frac{2f_B}{f_B}$$

$$\frac{E_A}{E_B} = 2$$

Correct Unattempted

Incorrect Q 2/10

Q : Which one of the following radiations has the strongest photon?

A T.V waves

B Micro waves

C X-rays

D γ-rays

Explanation

Energy of γ rays is the largest E = hf

Correct

Unattempted

Incorrect

Q 3/10

Q : The curve drawn between velocity and frequency of photon in vacuum will be a:

A straight line parallel to velocity axis

B hyperbola

C straight line passing through origin and making an angle of 45° with frequency axis

D straight line parallel to frequency axis

Explanation

Information

Correct

Unattempted

Incorrect

Q 4/10

Q : The speed of photon :

A May be greater than speed of light

B Must be equal to speed of light

C May be less than speed of light

D Must be less than speed of light

Explanation

Information

Correct | Unattempted

Incorrect | Q 5/10

Q : A radio station emits 10 kW power of 90.8 MHz. Find the number of photon emitted per second

A 1.6×10^{28}

B 1.6×10^{29}

C 1.6×10^{30}

D 1.6×10^{32}

Explanation

$$P = \frac{E}{t} = \frac{nhf}{t} \Rightarrow \frac{n}{t} = \frac{P}{hf}$$

$$\frac{n}{t} = \frac{10 \times 10^{3}}{(6.63 \times 10^{-34})(90.8 \times 10^{6})}$$

$$n = 1.6 \times 10^{29} \text{ photons per second}$$

Correct Unattempted

Incorrect Q 6/10

Q : A photon is _____

A a unit of energy

B a positively charged particle

C a quantum of electromagnetic radiation

D a unit of wavelength

Explanation

Photon is energy packet of energy which are integral part of all electromagnetic radiations which cannot be subdivided according to Einstein.

Practice test 2 Unit 10

Correct

Unattempted

Incorrect

Q 7/10

Q : If n number of photon are striking on a metal surface, then total momentum exerted is _____

A nh/λ

B $2nh\lambda$

C zero

D n f×t

Explanation

As, $\frac{h}{\lambda}$ for 1 photon

$\therefore p = \frac{nh}{\lambda}$ for n photon

Correct | Unattempted

Incorrect | 8/10

Q : The momentum of a photon is 3.3×10^{-29} kg-m/sec. Its frequency will be

A 7.5×10^{12} Hz

B 6×10^{3} Hz

C 3×10^{3} Hz

D 1.5×10^{13} Hz.

Explanation

$$p = \frac{h}{\lambda} = \frac{h}{\frac{v}{f}} = \frac{hf}{v}$$

$$f = \frac{pv}{h} = \frac{(3.3\times10^{-29})(3\times10^{8})}{(6.64\times10^{-34})}$$

$$f = 1.5\times10^{13}\text{Hz}$$

Correct Unattempted

Incorrect Q 9/10

Q : The momentum of a photon is 2×10^{-16}gm-cm/sec. Its energy is

A 6×10^{-8}erg.

B 6×10^{-6}erg

C 2.0×10^{-26}erg

D 0.61×10^{-26}erg

Explanation

$$p=\frac{E}{C}\Rightarrow E=p\times c=2\times10^{-16}\times(3\times10^{10})$$

Correct Unattempted

Incorrect Q 10/10

Q : An AIR station is broadcasting the waves of wavelength 300 metres. If the radiating power of the transmitter is 10 kW, then the number of photons radiated per second is

A 1.5×10^{29}

B 1.5×10^{33}.

C 1.5×10^{31}

D 1.5×10^{35}

Explanation

$$P=\frac{W}{t}\Rightarrow\frac{nhc}{\lambda t}\Rightarrow\left(\frac{n}{t}\right)=\frac{P\lambda}{hc}=\frac{10\times10^{3}\times}{6.6\times10^{-34}\times}$$

QUIZZES

Practice test 3 Unit 10

10 Questions

7 min

Topics

The wave nature of particles

Start Quiz

06 : 59

Q 1/10 7 min Hint

Q : Louise de-Broglie wavelength of a particle can be expressed by:

A $\lambda = \frac{P}{h}$

B $\lambda = \frac{h}{P}$

C $\lambda = \frac{h}{mc}$

D none of these

06 : 57

Q 2/10 7 min Hint

Q : Interference and diffraction of light confirm its

A particle nature of light

B wave nature of light

C dual nature of light

D electromagnetic nature of light

06 : 55

Q 3/10 7 min Hint

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

A 10^{-10}m

B 10^{-30} m

C 10^{-20} m

D 10^{-40} m

06 : 52

Q 4/10 7 min Hint

Q :

X rays are similar in nature to _____

A Cathode rays

B Positive rays

C Gamma- rays

D α- rays

06 : 50

Q 5/10 7 min Hint

Q : According to De-Broglie, an electron can be regarded as:

A particle only

B are negligible

C particle and wave both

D none of these

06 : 47

Q 6/10 7 min Hint

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg • m/s?

A 0.0002 nm

B 0.002 nm

C 0.02 nm

D 0.2 nm

06 : 45

Q 7/10 7 min Hint

Q : The velocity of a particle of mass m of de-Broglie wavelength λ is _____

A $\frac{2h}{m\lambda}$

B $\frac{m\lambda c^2}{h}$

C $2m\lambda c^2$

D $h/m\lambda$

06 : 43

Q 8/10 7 min Hint

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

A 10^{-10}m

B 10^{-30} m

C 10^{-20} m

D 10^{-40} m

06 : 41

Q 9/10 7 min Hint

Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

A is the electron

B is the proton

C is the uranium nucleus

D depends upon the wavelength and the properties of the particle.

06 : 38

Q 10/10 7 min Hint

Q : **The magnitude of de-Broglie wavelength (λ) of electrons (e) proton (p) neutron n and α particles, all have the same energy 1 MeV, in increasing order will follow the sequence.**

A $\lambda_e, \lambda_p, \lambda_n, \lambda_\alpha$

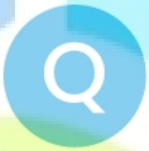
B $\lambda_e, \lambda_p, \lambda_n, \lambda_\alpha$

C $\lambda_\alpha, \lambda_n, \lambda_p, \lambda_e$

D $\lambda_\alpha, \lambda_p, \lambda_n, \lambda_e$

QUIZ RESULT

Practice test 3 Unit 10



10

7 min

03-May-2021

0 sec

0/10

0.0%

Result Detail

Incorrect

1/10

Q : Louise de-Broglie wavelength of a particle can be expressed by:

A $\lambda = \frac{P}{h}$

B $\lambda = \frac{h}{P}$

C $\lambda = \frac{h}{mc}$

D none of these

Explanation

$E = mc^2$

$hf = (mc)c$

$hf = Pc$

$\frac{hc}{\lambda} = Pc$

$\lambda = \frac{h}{P}$

Correct Unattempted

Incorrect Q 2/10

Q : Interference and diffraction of light confirm its

A particle nature of light

B wave nature of light

C dual nature of light

D electromagnetic nature of light

Explanation

It is properties of wave.

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

A 10^{-10}m

B 10^{-30} m

C 10^{-20} m

D 10^{-40} m

Explanation

$m = 200\ g = 0.2\ kg,\ v = 5\ \frac{m}{hr} = \frac{5}{3600}$

$p = \frac{h}{\lambda} = mv$

$\therefore \lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34} \times 3600}{0.2 \times 5}$

$= 23.85 \times 10^{-31}$

$= 2.385 \times 10^{-30}$

$= 10^{-30} m$

Correct Unattempted

Incorrect Q 4/10

Q :

X rays are similar in nature to _____

A Cathode rays

B Positive rays

C Gamma- rays

D α- rays

Explanation

Both X-Rays & Gamma-rays are electromagnetic.

Correct

Unattempted

Incorrect

Q 5/10

Q : According to De-Broglie, an electron can be regarded as:

A particle only

B are negligible

C particle and wave both

D none of these

Explanation

$$\lambda = \frac{h}{p}$$

De-Broglie assumed that electron can be regarded a s particle and as a well. Davisson and Germer proved the wave nature of electron.

Correct Unattempted

Incorrect Q 6/10

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg • m/s?

A 0.0002 nm

B 0.002 nm

C 0.02 nm

D 0.2 nm

Explanation

$$\lambda = \frac{h}{p} = \frac{6.6 \times 10^{-34}}{3.3 \times 10^{-23}}$$

$$\lambda = 2 \times 10^{-11}\,m = 2 \times 10^{-2} \times 10^{-9}\,m$$

$$= 0.02\,nm$$

Correct Unattempted

Incorrect Q 7/10

Q : The velocity of a particle of mass m of de-Broglie wavelength λ is _____

A $\frac{2h}{m\lambda}$

B $\frac{m\lambda c^2}{h}$

C $2m\lambda c^2$

D $h/m\lambda$

Explanation

$\lambda = \frac{h}{mv} \rightarrow v = \frac{h}{m\lambda}$

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

A 10^{-10}m

B 10^{-30} m

C 10^{-20} m

D 10^{-40} m

Explanation

$m = 200\ g = 0.2\ kg, v = 5\ \frac{m}{hr} = \frac{5}{3600}\ \frac{m}{s}$

$p = \frac{h}{\lambda} = mv$

$\therefore \lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34} \times 3600}{0.2 \times 5}$

$= 23.85 \times 10^{-31}$

$= 2.385 \times 10^{-30}$

$= 10^{-30}$m

Correct | Unattempted

Incorrect | 9/10

Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

A is the electron

B is the proton

C is the uranium nucleus

D depends upon the wavelength and the properties of the particle.

Explanation

$\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2mE}} \Rightarrow E = \frac{h^2}{2m\lambda^2}$ $\therefore \lambda$ is same for all, so $E \propto \frac{1}{m}$ Hence energy will be maximum for particle with lecher mass

Correct Unattempted

Incorrect Q 10/10

Q : **The magnitude of de-Broglie wavelength (λ) of electrons (e) proton (p) neutron n and α particles, all have the same energy 1 MeV, in increasing order will follow the sequence.**

A $\lambda_e, \lambda_p, \lambda_n, \lambda_\alpha$

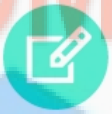
B $\lambda_e, \lambda_p, \lambda_n, \lambda_\alpha$

C $\lambda_\alpha, \lambda_n, \lambda_p, \lambda_e$

D $\lambda_\alpha, \lambda_p, \lambda_n, \lambda_e$

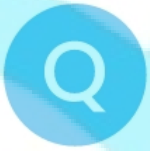
Explanation

$$\lambda = \frac{h}{\sqrt{2mE_k}} \propto \frac{1}{\sqrt{m}}$$ for same kinetic energy



QUIZZES

Practice test 4. Unit 10



10 Questions

7 min

Topics

The wave-particle duality

Start Quiz

06 : 59

Q 1/10 7 min Hint

Q : What is the momentum of a photon having frequency $1.5 \times 10^{13} Hz$?

A $3.3 \times 10^{-29} kg - m/s$

B $6.6 \times 10^{-34} kg - m/s$

C $3.3 \times 10^{-34} kg - m/s$

D $6.6 \times 10^{-30} kg - m/s$

06 : 57

Q 2/10 7 min Hint

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

A 10^{-10}m

B 10^{-30} m

C 10^{-20} m

D 10^{-40} m

06 : 55

Q 3/10 7 min Hint

Q : If an electron is accelerated through a potential difference of 54 volts, its de-Broglie wavelength will be:

A 1.66×10^{-8}m

B 1.66×10^{-9}m

C 1.66×10^{-10}m

D 1.66×10^{-12}m

06 : 53

Q 4/10 7 min Hint

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg • m/s?

A 0.0002 nm

B 0.002 nm

C 0.02 nm

D 0.2 nm

06 : 52

Q 5/10 7 min Hint

Q : The electron, accelerated by a potential difference V has de-Broglie wavelength λ. If the electron is accelerated by a p.d 4V, its de-Broglie wavelength will be

A 2λ

B 4λ

C $\frac{\lambda}{2}$

D $\frac{\lambda}{4}$

06 : 50

Q 6/10 7 min Hint

Q : The wavelength of matter waves is independent of:

A Mass

B Velocity

C Momentum

D Charge

06 : 49

Q 7/10 7 min Hint

Q : Ratio of momentum of photons having wavelength 4000 angstrom and 8000 angstrom is

A 2 : 1

B 1 : 2

C 20 : 1

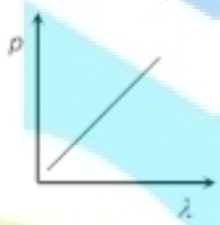
D 1 : 20

06 : 46

Q 8/10 7 min Hint

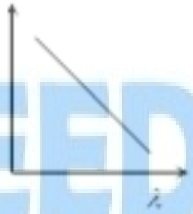
Q : Which of the following figure represents the variation of particle momentum and the associated de-Broglie wavelength

A



B

C



D

06 : 44

Q 9/10 7 min Hint

Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

A is the electron

B is the proton

C is the uranium nucleus

D depends upon the wavelength and the properties of the particle.

06 : 43

Q 10/10 7 min Hint

Q : A proton and α particle are accelerated through the same kinetic energy. The ratio of their de-Broglie wavelength $(\lambda_p / \lambda_\alpha)$.

A 1:1

B $\sqrt{2}:1$

C 2:1

D 4:1

QUIZ RESULT

Practice test 4. Unit 10

10

7 min

03-May-2021

0 sec

0/10

0.0%

Result Detail

Correct Unattempted

Incorrect Q 1/10

Q : What is the momentum of a photon having frequency $1.5 \times 10^{13} Hz$?

A $3.3 \times 10^{-29} kg - m/s$

B $6.6 \times 10^{-34} kg - m/s$

C $3.3 \times 10^{-34} kg - m/s$

D $6.6 \times 10^{-30} kg - m/s$

Explanation

Momentum = (Energy/c)

$$\therefore p = \frac{hf}{c} = \frac{(6.62 \times 10^{-34})(1.5 \times 10^{13})}{3 \times 10^{8}} = 3.$$

Q : A body of mass 200 g moves at the speed of 5 m/hr. So de-Broglie wavelength related to it is of the order ($h=6.26 \times 10^{-34}$ Js)

A 10^{-10}m

B 10^{-30} m

C 10^{-20} m

D 10^{-40} m

Explanation

$$m = 200\,g = 0.2\,kg,\ v = 5\,\frac{m}{hr} = \frac{5}{3600}$$

$$p = \frac{h}{\lambda} = mv$$

$$\therefore \lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34} \times 3600}{0.2 \times 5}$$

$$= 23.85 \times 10^{-31}$$

$$= 2.385 \times 10^{-30}$$

$$= 10^{-30} m$$

Correct Unattempted

Incorrect 3/10

Q : If an electron is accelerated through a potential difference of 54 volts, its de-Broglie wavelength will be:

A 1.66×10^{-8}m

B 1.66×10^{-9}m

C 1.66×10^{-10}m

D 1.66×10^{-12}m

Explanation

$$\lambda = \frac{h}{\sqrt{2mVe}}$$

$$\lambda = \frac{6.673 \times 10^{-34}}{\sqrt{2 \times 9.1 \times 10^{-31} \times 54 \times 1.6 \times 10^{-19}}}$$

$$\lambda = 1.66 \times 10^{-10} m$$

Correct

Unattempted

Incorrect

Q 4/10

Q : What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of 3.3×10^{-23} kg • m/s?

A 0.0002 nm

B 0.002 nm

C 0.02 nm

D 0.2 nm

Explanation

$$\lambda = \frac{h}{p} = \frac{6.6 \times 10^{-34}}{3.3 \times 10^{-23}}$$

$$\lambda = 2 \times 10^{-11}\,m = 2 \times 10^{-2} \times 10^{-9}\,m$$

$$= 0.02\,nm$$

Correct Unattempted

Incorrect Q 5/10

Q : The electron, accelerated by a potential difference V has de-Broglie wavelength λ. If the electron is accelerated by a p.d 4V, its de-Broglie wavelength will be

A 2λ

B 4λ

C $\frac{\lambda}{2}$

D $\frac{\lambda}{4}$

Explanation

$$\lambda = \frac{h}{\sqrt{2meV}} \rightarrow \lambda \propto \frac{1}{\sqrt{V}}$$

Correct Unattempted

Incorrect Q 6/10

Q : The wavelength of matter waves is independent of:

A Mass

B Velocity

C Momentum

D Charge

Explanation

According to $\lambda = \frac{h}{mv}$, wavelength is independent of charge.

Correct Unattempted

Incorrect Q 7/10

Q : Ratio of momentum of photons having wavelength 4000 angstrom and 8000 angstrom is

A 2 : 1

B 1 : 2

C 20 : 1

D 1 : 20

Explanation

$$P = \frac{h}{\lambda} \quad \therefore \; P \propto \frac{1}{\lambda}$$

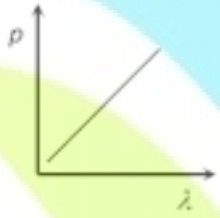
$$\therefore \frac{P_1}{P_2} = \frac{\lambda_2}{\lambda_1} = \frac{8000}{4000} = \frac{2}{1}$$

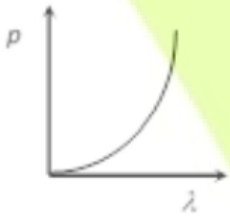
$$\therefore \frac{P_1}{P_2} = 2 : 1$$

Correct Unattempted

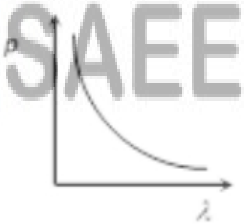
Incorrect Q 8/10

Q : Which of the following figure represents the variation of particle momentum and the associated de-Broglie wavelength

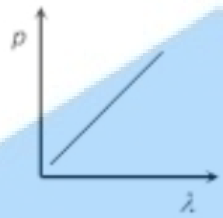
A 

B 

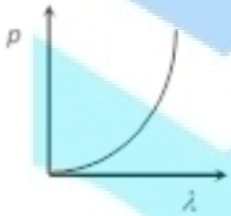
C 

D 

A

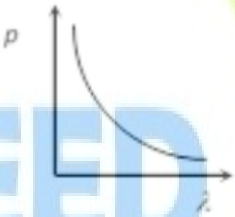


B



C

D



Explanation

$$\lambda = \frac{\hbar}{p} \Rightarrow \lambda \propto \frac{1}{p}$$

De-Brogile wavelength
i.e graph will be a rectangular hyperbola

Correct | Unattempted

Incorrect | 9/10

Q : A proton, an electron and a uranium nucleus all have the same wavelength. The one with the most energy

A is the electron

B is the proton

C is the uranium nucleus

D depends upon the wavelength and the properties of the particle.

Explanation

$\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2mE}} \Rightarrow E = \frac{h^2}{2m\lambda^2}$ $\therefore \lambda$ is same for all, so $E \propto \frac{1}{m}$ Hence energy will be maximum for particle with lecher mass

Correct Unattempted

Incorrect Q 10/10

Q : A proton and $^{\alpha}$ particle are accelerated through the same kinetic energy. The ratio of their de-Broglie wavelength $(\lambda_p / \lambda_\alpha)$.

A 1:1

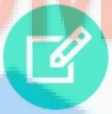
B $\sqrt{2}:1$

C 2:1

D 4:1

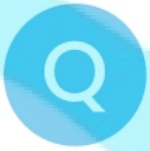
Explanation

$$\lambda = \frac{h}{\sqrt{m_p E_k}} \propto \frac{1}{\sqrt{m}} \therefore \frac{\lambda_p}{\lambda_\alpha} = \sqrt{\frac{m_\alpha}{m_p}} = \sqrt{\frac{4m_p}{m_p}}$$



QUIZZES

Practice test 4 Unit 10



10 Questions

7 min

Topics

Rectification

Start Quiz

06 : 59

Q 1/10 7 min Hint

Q : If a full wave rectifier circuit is operating from 50 Hz mains, the fundamental frequency in the ripple will be

A 25 Hz

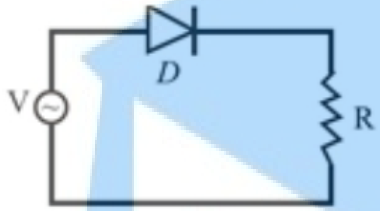
B 50 Hz

C 70.7 Hz

D 100 Hz

06 : 50

Q : A pn junction (D) shown in the figure can act as a rectifier. An alternating current source (V) is connected in the circuit. The output current in the circuit is represented by:



A

B

C

D

06 : 48

Q 3/10 7 min Hint

Q : In full wave rectification by bridge the number of diodes required are

A 3

B 5

C 2

D 4

06 : 42

Q 4/10 7 min Hint

Q : The process in which A.C is converted into D.C is

A amplification

B sterilization

C rectification

D magnification

06 : 39

Q 5/10 7 min Hint

Q : The output voltage of a rectifier is

A smooth

B pulsating

C straight

D parabolic

06 : 38

Q 6/10 7 min Hint

Q :

In a semiconductor diode, the barrier offers opposition to only

A Majority carries in both regions

B Minority carries in both regions

C B, C

D Holes in the p-regions

06 : 36

Q 7/10 7 min Hint

Q :

Select the correct statement

A In a full wave rectifier, two diodes work alternately

B In a full wave rectifier, two diodes work simultaneously

C The efficiency of full wave and half wave rectifiers is same

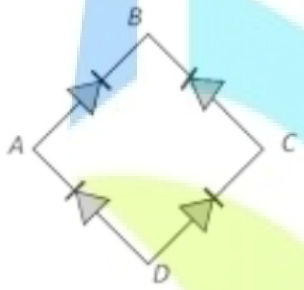
D The full wave rectifier is bi-directional.

06 : 17

Q 8/10 7 min Hint

Q :

In the diagram, the input is across the terminals A and C and the output is across the terminals B and D, then the output is



A Zero

B Same as input

C Full wave rectifier

D Half wave rectifier

06 : 15

Q 9/10 7 min Hint

Q :

In the depletion region of an unbiased P-N junction diode there are

A Only electrons

B Only holes

C Both electrons and holes

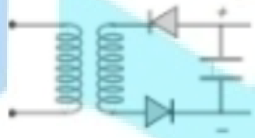
D Only fixed ions

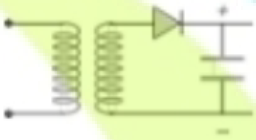
06 : 13

Q 10/10 7 min Hint

Q :

Which is the correct diagram of a half-wave rectifier

A 

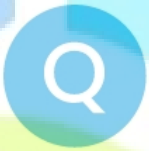
B 

C 

D 

QUIZ RESULT

Practice test 4 Unit 10



10

7 min

03-May-2021

0 sec

0/10

0.0%

Result Detail

Correct Unattempted

Incorrect Q 1/10

Q : If a full wave rectifier circuit is operating from 50 Hz mains, the fundamental frequency in the ripple will be

A 25 Hz

B 50 Hz

C 70.7 Hz

D 100 Hz

Explanation

In a full wave rectifier, the fundamental frequency in ripple is twice of input frequency.

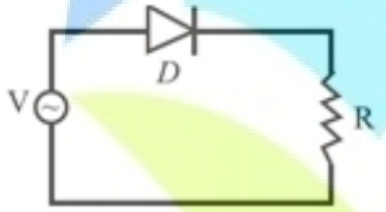
Correct

Unattempted

Incorrect

Q 2/10

Q : A pn junction (D) shown in the figure can act as a rectifier. An alternating current source (V) is connected in the circuit. The output current in the circuit is represented by:



A 

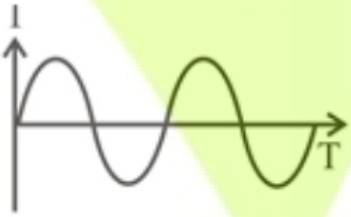
B 

C 

A

B

C



D

Explanation

the given circuit is for half wave rectification

Practice test 4 Unit 10

Correct

Unattempted

Incorrect

Q 3/10

Q : In full wave rectification by bridge the number of diodes required are

A 3

B 5

C 2

D 4

Explanation

In full wave rectification bridge circuit requires 4 diodes.

Correct Unattempted

Incorrect Q 4/10

Q : The process in which A.C is converted into D.C is

A amplification

B sterilization

C rectification

D magnification

Explanation

Definition of rectification

Correct

Unattempted

Incorrect

Q 5/10

Q : The output voltage of a rectifier is

A smooth

B pulsating

C straight

D parabolic

Explanation

Book line

Correct

Unattempted

Incorrect

Q 6/10

Q :

In a semiconductor diode, the barrier offers opposition to only

A Majority carries in both regions

B Minority carries in both regions

C B, C

D Holes in the p-regions

Correct

Unattempted

Incorrect

Q 7/10

Q :

Select the correct statement

A In a full wave rectifier, two diodes work alternately

B In a full wave rectifier, two diodes work simultaneously

C The efficiency of full wave and half wave rectifiers is same

D The full wave rectifier is bi-directional.

Correct

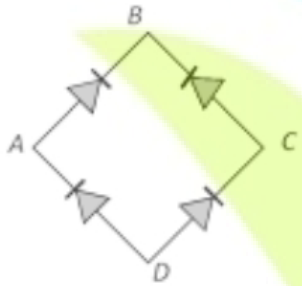
Unattempted

Incorrect

Q 8/10

Q :

In the diagram, the input is across the terminals A and C and the output is across the terminals B and D, then the output is



A Zero

B Same as input

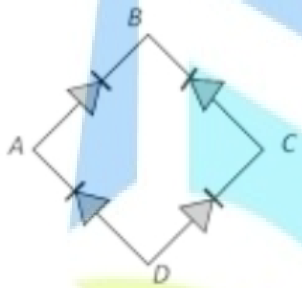
C Full wave rectifier

D Half wave rectifier

Explanation

Q :

In the diagram, the input is across the terminals A and C and the output is across the terminals B and D, then the output is



A Zero

B Same as input

C Full wave rectifier

D Half wave rectifier

Explanation

The given circuit is full wave rectifier.

Correct

Unattempted

Incorrect

Q 9/10

Q :

In the depletion region of an unbiased P-N junction diode there are

A Only electrons

B Only holes

C Both electrons and holes

D Only fixed ions

Correct

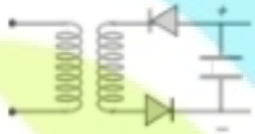
Unattempted

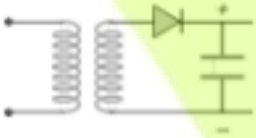
Incorrect

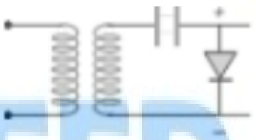
Q 10/10

Q :

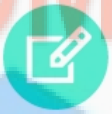
Which is the correct diagram of a half-wave rectifier

A 

B 

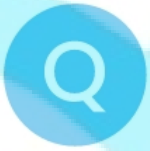
C 

D 



QUIZZES

Practice test 5 Unit 10



10 Questions

7 min

Topics

The wave-particle duality, Uncertainty principle

Start Quiz

06 : 59

Q 1/10 7 min Hint

Q : Louise de-Broglie wavelength of a particle can be expressed by:

A $\lambda = \frac{P}{h}$

B $\lambda = \frac{h}{P}$

C $\lambda = \frac{h}{mc}$

D none of these

06 : 56

Q 2/10 7 min Hint

Q : According to Heisenberg's principle, the product of uncertainty Δx in the position of particle at some instant and the uncertainty ΔP in the x component of momentum at the same instant approximately equal to

A Boltzman's constant

B Plank's constant

C Davisson and Germen principle

D Uncertainty principle

06 : 54

Q 3/10 7 min Hint

Q :

Uncertainty in position of electron will be minimum for light of_____wavelength

A larger

B smaller

C intermediate

D infinite

06 : 53

Q 4/10 7 min Hint

Q : To decrease uncertainty in the measurement of position and momentum of a particle

	Position	Momentum
(a)	Decrease λ	Increase λ
(b)	Increase λ	Decrease λ
(c)	Decrease λ	Decrease λ
(d)	Increase λ	Increase λ

A Decrease λ Increase λ

B Increase λ Decrease λ

C Decrease λ Decrease λ

D Increase λ Increase λ

06 : 51

Q 5/10 7 min Hint

Q : In order to reduce the uncertainity in momentum, light of _____ wavelength is used

A smaller

B larger

C intermediate

D infinite

06 : 48

Q 6/10 7 min Hint

Q : An electron placed in a box about size of an atom that is about 1×10^{-10}m. The lift-time of an electron in an excited state about 10^{-8}sec. What is the uncertainty in momentum and energy this time?

	U.C in momentum	U.C in energy
(a)	6.63 Js	6.63 J
(b)	6.63×10^{-24}Js	6.63×10^{-26}J
(c)	6.63×10^{-19}Js	6.63×10^{-34}J
(d)	6.63×10^{-20}Js	6.63×10^{-10}J

A 6.63 Js 6.63 J

B 6.63×10^{-24}Js 6.63×10^{-26}J

C 6.63×10^{-19}Js 6.63×10^{-34}J

D 6.63×10^{-20}Js 6.63×10^{-10}J

06 : 46

Q 7/10 7 min Hint

Q : According to De-Broglie, an electron can be regarded as:

A particle only

B are negligible

C particle and wave both

D none of these

06 : 44

Q 8/10 7 min Hint

Q : The form of uncertainty principle which relates the energy of a particle and the time at which it had the energy is given by:

A $\Delta_{E.h} \approx \Delta t$

B $\Delta E . \Delta t \approx 2h$

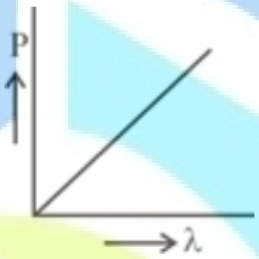
C $\Delta E . \Delta P \approx h$

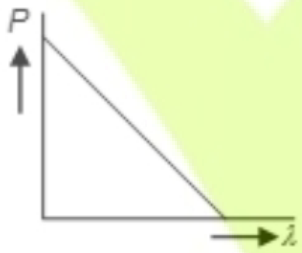
D $\Delta E . \Delta t \approx h$

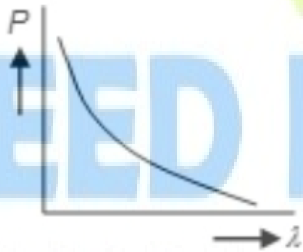
06 : 41

Q 9/10 7 min Hint

Q : Which of the following graphs represent the variation of particle momentum and the associated de-Broglie wavelength?

A 

B 

C 

D None

06 : 39

Q 10/10 7 min Hint

Q : If an electron and a photon propagate in the form of waves having the same wavelength, it implies that they have the same

A velocity

B energy

C angular momentum

D Momentum

QUIZ RESULT

Practice test 5 Unit 10

10	7 min
03-May-2021	0 sec
0/10	0.0%

Result Detail

Incorrect

1/10

Q : Louise de-Broglie wavelength of a particle can be expressed by:

A $\lambda = \frac{P}{h}$

B $\lambda = \frac{h}{P}$

C $\lambda = \frac{h}{mc}$

D none of these

Explanation

$E = mc^2$

$hf = (mc)c$

$hf = Pc$

$\frac{hc}{\lambda} = Pc$

$\lambda = \frac{h}{P}$

Correct Unattempted

Incorrect Q 2/10

Q : According to Heisenberg's principle, the product of uncertainty Δx in the position of particle at some instant and the uncertainty ΔP in the x component of momentum at the same instant approximately equal to

A Boltzman's constant

B Plank's constant

C Davisson and Germen principle

D Uncertainty principle

Explanation

$\Delta x . \Delta P \approx h$

Correct Unattempted

Incorrect Q 3/10

Q :

Uncertainty in position of electron will be minimum for light of_____wavelength

A larger

B smaller

C intermediate

D infinite

Explanation

$\Delta x \approx \lambda$

Q : To decrease uncertainty in the measurement of position and momentum of a particle

	Position	Momentum
(a)	Decrease λ	Increase λ
(b)	Increase λ	Decrease λ
(c)	Decrease λ	Decrease λ
(d)	Increase λ	Increase λ

A Decrease λ Increase λ

B Increase λ Decrease λ

C Decrease λ Decrease λ

D Increase λ Increase λ

Explanation

To reduce uncertainty in position we need photon of shorter wavelength and to reduce

Uncertainty in momentum we need photon of longer wavelength

Correct Unattempted

Incorrect Q 5/10

Q : In order to reduce the uncertainity in momentum, light of _____ wavelength is used

A smaller

B larger

C intermediate

D infinite

Explanation

$$\Delta P \approx \frac{h}{\Delta x}$$

Correct Unattempted

Incorrect Q 6/10

Q : An electron placed in a box about size of an atom that is about 1×10^{-10}m. The lift-time of an electron in an excited state about 10^{-8}sec. What is the uncertainty in momentum and energy this time?

	U.C in momentum	U.C in energy
(a)	6.63 Js	6.63 J
(b)	6.63×10^{-24}Js	6.63×10^{-26}J
(c)	6.63×10^{-19}Js	6.63×10^{-34}J
(d)	6.63×10^{-20}Js	6.63×10^{-10}J

A 6.63 Js 6.63 J

B 6.63×10^{-24}Js 6.63×10^{-26}J

C 6.63×10^{-19}Js 6.63×10^{-34}J

D 6.63×10^{-20}Js 6.63×10^{-10}J

Explanation

A 6.63 Js 6.63 J

B 6.63×10^{-24}Js 6.63×10^{-26}J

C 6.63×10^{-19}Js 6.63×10^{-34}J

D 6.63×10^{-20}Js 6.63×10^{-10}J

Explanation

$$\Delta x.\Delta P \approx h$$

$$\Delta P \approx \frac{h}{\Delta x}$$

$$\Delta P \approx \frac{6.63\times10^{-34}}{1\times10^{-10}}$$

$$\underline{\Delta P \approx 6.63\times10^{-24}\,Js}$$

$$\Delta E.\Delta t \approx h$$

$$\Delta E \approx \frac{h}{\Delta t}$$

$$\Delta E = \frac{6.63\times10^{-34}}{10^{-8}}$$

$$\underline{\Delta E = 6.63\times10^{-26}\,J}$$

Correct

Unattempted

Incorrect

Q 7/10

Q : According to De-Broglie, an electron can be regarded as:

A particle only

B are negligible

C particle and wave both

D none of these

Explanation

$$\lambda = \frac{h}{p}$$

De-Broglie assumed that electron can be regarded a s particle and as a well. Davisson and Germer proved the wave nature of electron.

Correct

Unattempted

Incorrect

Q 8/10

Q : The form of uncertainty principle which relates the energy of a particle and the time at which it had the energy is given by:

A $\Delta_{E.h} \approx \Delta t$

B $\Delta E . \Delta t \approx 2h$

C $\Delta E . \Delta P \approx h$

D $\Delta E . \Delta t \approx h$

Explanation

In terms of energy and time

$\Delta E . \Delta t \approx h$

Correct

Unattempted

Incorrect

Q 10/10

Q : If an electron and a photon propagate in the form of waves having the same wavelength, it implies that they have the same

A velocity

B energy

C angular momentum

D Momentum

Explanation

If an electron and a photon propagates in the form of waves having the same wavelength, it implies that they have same momentum. This is according to de-Broglie equation, $p \propto 1/\lambda$